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ABSTRACT

Retirement may have a negative effect on a person's health, and may even accelerate death. To determine the validity of this effect, time intervals between reported retirement date and death date were tabulated for retirees from a large petroleum corporation. A regression analyses was performed to control for physiological factors, job status, and type of work differences that might influence longevity. Examination of the residuals showed a bimodal distribution: one group lived an average of 6.5 years beyond retirement date, while a second group lived an average of 19 years after retirement. The data suggest that short-term survivors after retirement may undergo a different adjustment process from long-term survivors. These results, combined with findings of other research, imply a need for further examination in the field of health care management. (Author/NRB)

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SURVIVAL AFTER RETIREMENT

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INTRODUCTION

It is often said that retirement has a negative effect on a person's health, and may indeed accelerate his death. For example, see Haynes et. al. (1978). To see whether the 'effect' could be easily validated, we tabulated the time intervals between reported retirement date and death date, using data from an in-house corporate publication.

Two frequency peaks were noticeable in a plot against time. There thus seem to be two classes of persons. One class lives an average of 6.5 years beyond retirement date, while the second class lives, on the average, about 19 years after retiring. A partial explanation might be that some of the first class retire because they are sick, and there may be other pertinent factors such as sex and occupation. However, the major reason for the first class might be the presence of an intense psychological job-association. It is the purpose of this paper to explore the effects of some of these variables.

The present study tests the notion that, if we observe the life spans of workers, after controlling for differences due to job status, sex, and age at time of death, would we find a bimodal distribution of survival years beyond retirement?

In a recent conference on "Issues in Retirement Research" sponsored by the Scripps Foundation of Gerontology, Atchley (1979) observed that little is known about the effects of retirement on individuals, especially for different occupational groups. Given that the average age of the labor force is gradually increasing as a result of the post World War II baby boom, a significant increase will occur over the next decade in the number of workers either planning for retirement or making the decision to retire (Employment and Training Report of the President, 1980). These changes will present significant challenges for health care and personnel policies designed to facilitate the transition of large numbers of individuals from work to nonwork roles.

Several theories have been advanced to explain the retirement process and the adjustment to job loss upon retirement (Atchley, 1975). Three current theories of adjustment have implications for longevity beyond retirement. Activity theory (Friedman & Havighurst; 1954) proposes that retirement and the subsequent loss of job places pressures on the individual to substitute activities that will enable the individual to pursue the personal goals that previously were pursued in the job. Continuity theory (Atchley, 1972) suggests that rather than locate new activities, the job retiree increases his involvement in nonwork activities currently being pursued. Disengagement theory (Cumming & Henry, 1962) proposes that retirement is a form of mutual withdrawal from society, thus individuals reduce their activities consistent with declining energy levels associated with aging. Streib and Schneider (1971), based on the Cornell Study of

Occupational Retirement, have proposed that individuals disengage at different rates for different roles.

Taken together, the theories suggest that the retirement decision brings a major change into the life of a worker. Although few studies of longevity beyond retirement exist (Carp, 1972; Gillaspy, Keppel, & DeJong, 1979; Haynes, McMichael, & Tyroler, 1978; Palmore & Jeffers, 1971; Rose & Bell, 1971), the available research seems to suggest that individuals do react differently to retirement. The majority of these studies, however, focus on attitudes toward retirement (Barfield & Morgan, 1978) rather than the actual consequences of successful or unsuccessful adjustment to loss of job.

Three studies have examined the life/death consequence of retirement. Haynes, McMichael and Tyroler (1978) in a study of blue collar workers in the tire industry concluded that pre-retirement health status was significantly related to survival after early retirement. For workers who retired normally, lower status workers died earlier than higher status workers. Pfeiffer (1971) and Palmore (1971) using data from the Duke University Center for the Study of Aging and Human Development concluded that biological, psychological and social factors influence longevity beyond retirement.

METHOD

An in-house publication was used to identify individuals who retired and subsequently died between September, 1972 and December, 1980. A total of 3725 observations were drawn from seven divisions within the corporation.

The data available contain several variables which might help explain the phenomenon. These are:

Subsidiary company (there are seven identifiable)

Sex (male, female, unknown)

Job type (white collar, technical, blue collar, supervisory, unknown)

Regressions were run using dummy variables based on the above categories. The dependent variable was Delta, the difference between death date and retirement date.

Delta = Constant + a*x(1) + b*x(2) + ... m*x(13) + e

Variables were defined as follows:

x(1) = 1.0 if company = 1, otherwise zero
x(2) = 1.0 if company = 2, otherwise zero
etc
x(7) = 1.0 if company = 7, otherwise zero

x(8) = 1.0 if male, otherwise zero
x(9) = 1.0 if female, otherwise zero

x(10) = 1.0 if job = 1, otherwise zero
x(11) = 1.0 if job = 2, otherwise zero
x(12) = 1.0 if job = 3, otherwise zero
x(13) = 1.0 if job = 4, otherwise zero

In many cases the subsidiary, sex, or job type was unknown, forcing us therefore to include (in the case of sex, for example) both x(8) and x(9).

The question also arises as to whether some people might retire because they are ill, and that these persons might create the early peak. To check this, a series of runs were made, successively eliminating those with death dates less than 40, 45, ... 65.

Two types of analyses were conducted. First, a frequency distribution of the length of survival beyond retirement (Delta) was plotted to see if, in fact, a bimodal distribution existed as hypothesized. Second, a fre-

quency distribution of a regression residuals was plotted to explore whether a bimodal distribution would be observed after controlling for the effects of job status, the type of work performed, and the sex of the individual, all known factors that influence longevity.

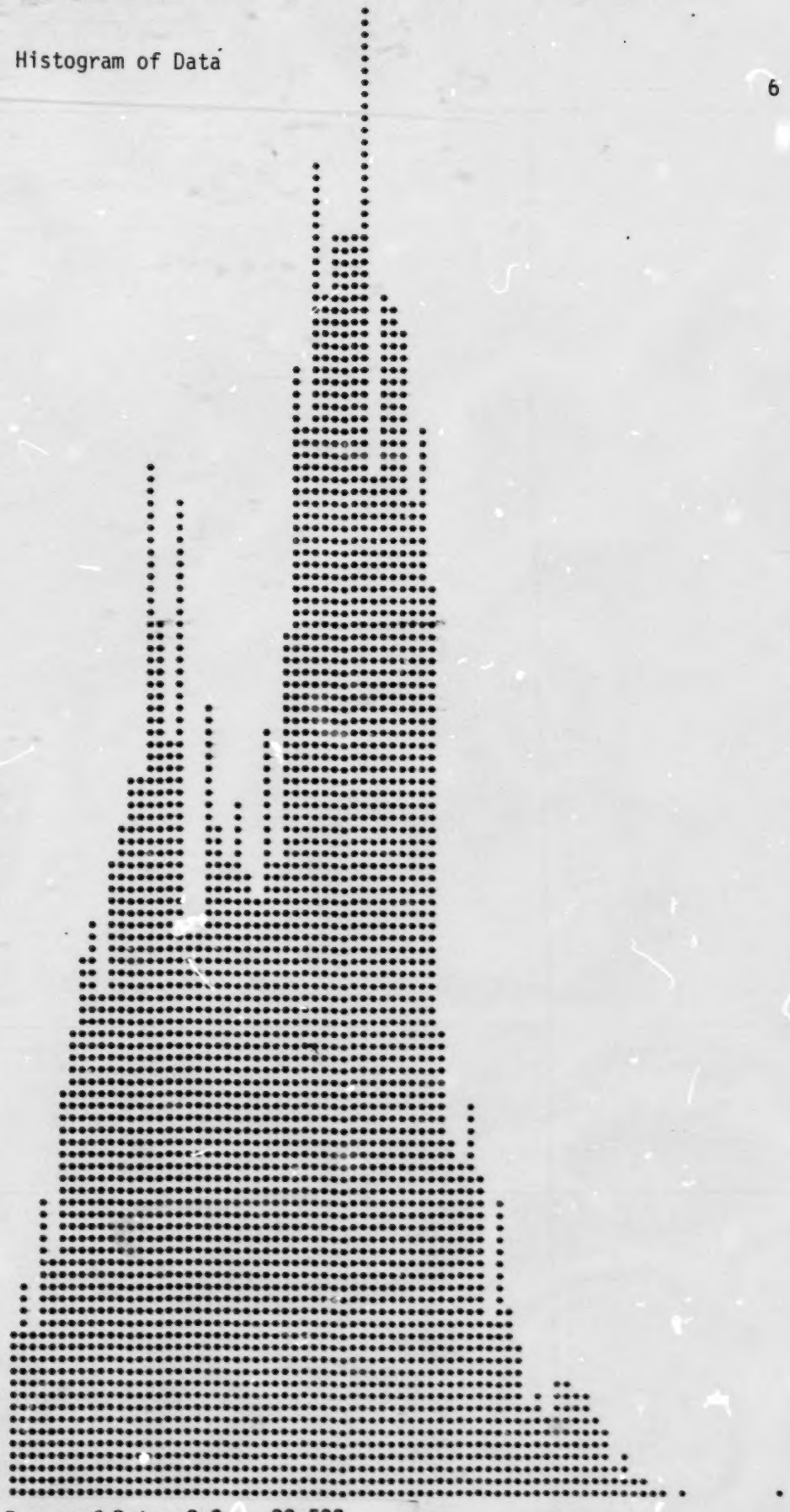
RESULTS

A frequency distribution of Delta (number of years lived beyond retirement) was plotted to explore the hypothesis that a differential adjustment to retirement will result in one group of individuals who die shortly after retirement, while a second group will live substantially longer. Figure 1 shows the histogram with death dates less than 65 eliminated. Other plots with death dates less than 40, 45 ... 60 were similar. As anticipated, two modes were observed; one between 6 to 10 years and a second between 16 to 24 years survival. The frequency distribution was divided at 13 years of survival so that the differences between the two groups could be more readily observed. The first group survived an average of 6.5 years beyond retirement (standard deviation = 3.50), while the second group survived an average of 19.0 years (standard deviation = 3.29, difference between the two group means significant at the 99 percent level).

In order to control for such factors as sex, job type, and corporate subsidiary, a series of regressions as described above were run, successively eliminating death dates less than 40, 45, 50 ... 65. The regression coefficients found to be significant are given in Table 1 (significance level = 0.95).

Figure 1

Histogram of Data



Range of Data= 0.0 39.503

Table 1

Significant (at 95 Percent) Regression Coefficients

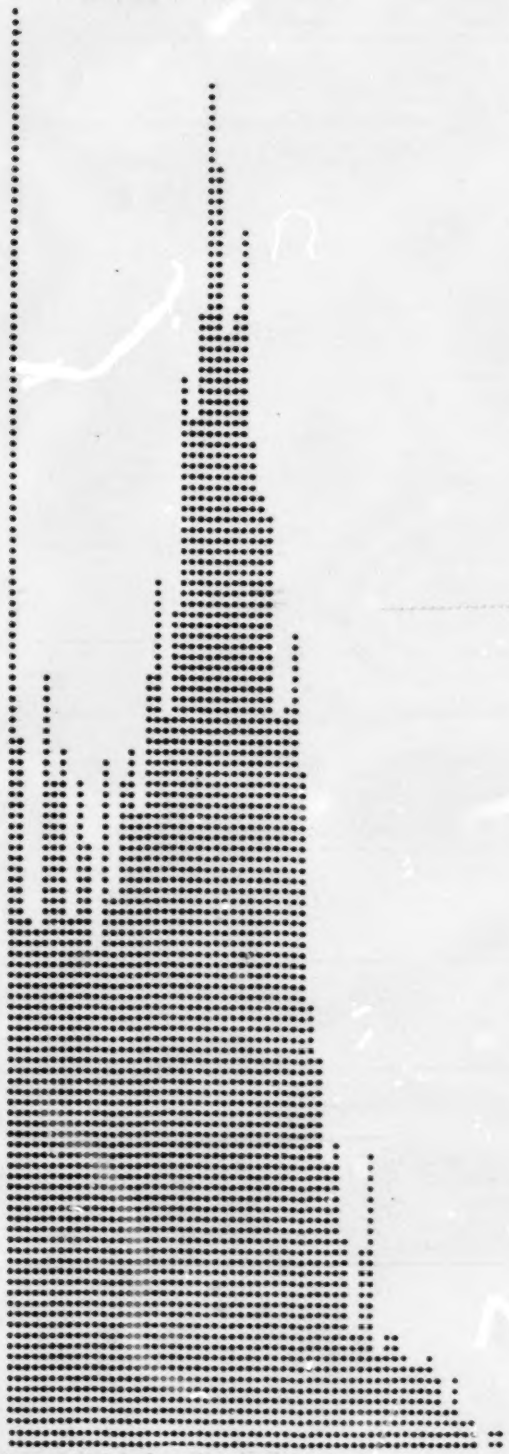
Minimum Death Age	None	45	50	55	60	65
Number of Data Points	3725	3708	3702	3663	3541	3230
Percent of Variation Explained	5.0	4.9	4.9	4.8	4.7	4.5
Variable	Regression Coefficients					
Headquarters	2.7	2.6	2.6	2.5	2.5	2.2
Exploration	2.3	2.3	2.3	2.3	2.1	2.0
Chemicals	-4.5	-4.5	-4.5	-4.6	-4.6	-4.6
R & D	-4.1	-4.0	-4.1	-3.9	-4.1	-3.3
Male	-1.9	-1.9	-1.9	-1.8	-1.7	-1.8
White Collar	-1.7	-1.6	-1.7	-1.6	-1.6	-1.5
Constant	14.7	14.7	14.7	14.8	15.0	16.0

A positive coefficient in the table indicates that a person in that category lives longer after retirement than average, while a negative coefficient indicates the converse. The table shows that employees in Corporate Headquarters and in Exploration & Production are longer-lived than average, while those in Chemicals, and Research & Development were shorter-lived. The remaining companies showed average life span. Male employees lived about two years less than females. Those in white collar jobs lived about two years less than average, and this was the only job category showing significance. The table also gives the percent of the variation explained by the regressions, and it is very small (5%) in all cases.

A series of histograms is also available for the residuals from the regressions, and two peaks are visible, agreeing with the above analysis that the available variables do not adequately explain the original phenomenon. Figure 2 shows the residuals histogram with death dates less than 65 eliminated. Other plots with death dates less than 40, 45, ... 60 are similar.

Figure 2

Histogram of Residuals



Range of Data -32.1269 13.7294

DISCUSSION

The results of this study suggest that short term survivors after retirement may indeed undergo a different adjustment process from survivors. After controlling for physiological factors, differences in survival beyond retirement were still observed. The limitation of the present study is that additional information such as individual characteristics of personality and intelligence, pre-retirement attitudes, work related attitudes, health practices and attitudes, or socio-economic characteristics were not available. Presumably, these omitted factors would help account for the large unexplained variation in the longevity index.

When these results, however, are combined with the results of others, several interesting implications are suggested for health care practices for the future. The Palmore (1971) and Pfeiffer (1971) regression studies of longevity did include additional measures of work satisfaction and an overall happiness rating that significantly distinguished short-term from long-term survivors of retirement. These regressions explained 17 percent and 38 percent, respectively, of the total variation. Thus, there appears to be not only empirical support of a bimodal survival distribution, but that psychological and social factors in addition to physiological factors account for differences among short and long-term survivors of retirement. Investments by employers in career counseling and planning for retirement, as well as providing preventive health care programs may increase worker longevity as well as improve the quality-of-life of retirees.

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